Dynamical Systems, MATH435/ CAAM435, Spring 2018

Meets: Tuesday-Thursday 1-2:15 PM (Location, to be announced)

Description: Dynamical Systems are used to describe the evolution of a changing system, either through *discrete steps* or *continuous time*. It developed historically along with ordinary differential equations and celestial mechanics. Now it has many other uses in applied science, such as in coding theory or biology, or in pure mathematics, such as in number theory or geometry.

We will follow the text "A First Course in Dynamics" by B. Haselblatt and A. Katok. This book makes a transition from a closer look at some ODE behavior to an examination of many more involved systems and examples. In fact the first half of the book, and much of the course, will be considering systems of increasing complexity going through some topics like asymptotic stability, linearization, recurrence, equidistribution, conservative systems, transitivity, entropy, and chaos. The second half includes a nice sampling of applications that illustrate some important notions and directions in dynamics. We will choose a few of these.

Instructor: Robert Hardt : Office: Herman Brown 430,
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Textbook: B. Haselblatt and A. Katok , *A First Course in Dynamics*, Cambridge U. Press 2003.

Recommended Prerequisites: (MATH 212 or MATH 221) and (CAAM 335 or MATH 355 or MATH 354) and (MATH 302 or MATH 321 or MATH 331)

Requirements: We anticipate having weekly homework, a single midterm, and a final with the grade being determined by the percentages:
midterm 20%, final 25%, homework 50%, class participation 5% .

Accommodations: If you have a (documented) disability and you would like an accommodation, please speak with me during the first two weeks of class. Any such information will of course remain confidential, and you certainly do not need to tell us any details beyond those we should expect to be hearing from the Office of Disability Support Services describing the accommodations you will be requiring. You'll also have to file forms with Disability Support Services in the Ley Student Center in order to have those accommodations implemented.